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GROWTH OF SUSTAINABLE ECONOMY BASED ON IMPORTS OF GOODS AND SERVICES IN ROMANIA

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Abstract
In this paper, is analyzed the influence of the import of goods and services on the gross domestic product for the period 1995-2018. The analyzed period of 24 years contains a critical period for the Romanian economy, in which the global economic crisis and the financial recession were felt. For analysis, the quadratic model is proposed, where a maximum point is obtained for the value of the import of goods and services and of the gross domestic product. So according to the model, if Romania's government policy is to increase the IMP then the GDP will decrease. Under these conditions, policies to promote imports as a strategy for developing a sustainable economy should be finished and the national economy, as well as exports, should be promoted and supported.

Key words: import, gross domestic product, cubic quadratic.

JEL Classification: C21, C51, C87

I. INTRODUCTION

As result of the political transformations occurred in 1989, the transition from communism to capitalism, Romania experienced a decline of the national economy. The Romanian governments had more or less pursued a policy of recovery of the national economy by privatizing the existing one or by encouraging the setting up of small and medium-sized enterprises. Therefore, an important role in the economic policy is the economic growth of the country. In order to measure economic growth, the gross domestic product (GDP) is considered the most important macroeconomic factor. GDP is calculated annually and represents the market value of all economic activities represented by the value of goods and services carried out within a country. The economic growth of a country it is analyzed in many economic studies (Anghelache & Gheorghe, 2012; Lupu, Sirghi & Asandului, 2015; Mihalciuc, Chistruga & Crijanovschii; Scurtu & Macovei, 2019; Macovei & Scutaru, 2016; Vlad & Balan, 2018; Ţigănescu & Roman, 2018).

International trade transactions between different countries of the world have a long history and contribute to the economic growth of a country. The important factor in the economic development is the external trade that contains the economic macro-indicators: the imports and exports of goods and services, by increasing the commercial relations with different countries (Perreira, 1996; Vojinović & Oplotnik, 2008). In Romania, foreign trade has undergone several changes in the post-December period, as example, in 2007 when Romania enters the European Union and in 2008-2010 when the global economic crisis also affects Romania. In the specialized literature there are numerous studies on the influence of exports on sustainable economic growth and the influence of imports on sustainable economic growth is less studied (Awokuse, 2018; Grossman & Helprnan, 1991; O'Donnell, 2014; Pascu, 2010; Pintilescu, Asandului, Viorică & Jemna, 2016; Ugwuegbe & Uruahpa, 2011).

Imports represent the totality of international commercial transactions through which goods and services purchased from other countries are introduced into a country and reflect the economic deficiencies of that country. On the other hand, the imports of raw materials that are the basis of a strong industry can generate a very strong economic mechanism. In numerous studies it is shown that the import has a positive impact on the economic growth of a developing country and especially the imports of advanced technology in the production process. These advanced technologies help in the production process, being much more efficient, leading to a much faster production growth. Therefore, the imports of goods and services are an important factor of the national economy, they have positive effects in the long or short term and they have a direct influence on GDP, which are related to the growth of the country's production. Currently, in Romania, the largest imports are auto parts that occupy the first place, medicines, crude oil, new cars, wiring harnesses, mobile phones, equipment for electrical circuits, integrated electronic circuits, fuels, plastics, etc. Romania imports from Germany, Italy, Hungary, France, Poland, etc.

The relationship between import and economic growth is a very important issue among economists and many field researchers. They tried to obtain a model of the causal relationship between these two factors. Nonlinear

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models are presented in the works (Dougherty, 2011; Fritsche, 2011; Jemna, 2012; Sarel.1995).

Therefore, in our study we propose as a model, the quadratic

$$Y = \alpha + \beta X + \gamma X^2 + \varepsilon,$$

where: Y is the dependent variable, X is the independent, α, β, γ are the parameters and ε is the random variable error.

II. Model Analysis. Empirical Data And Results

The present paper aims to analyze the evolution and interdependence between the gross domestic product and the imports of goods and services from 1995-2018 in Romania. The data used in the analysis are taken from the statistical directories published by the National Institute of Statistics of Romania.

The evolution of the indicator specific to *GDP* during the timescale under analysis were illustrated in Figure 1:

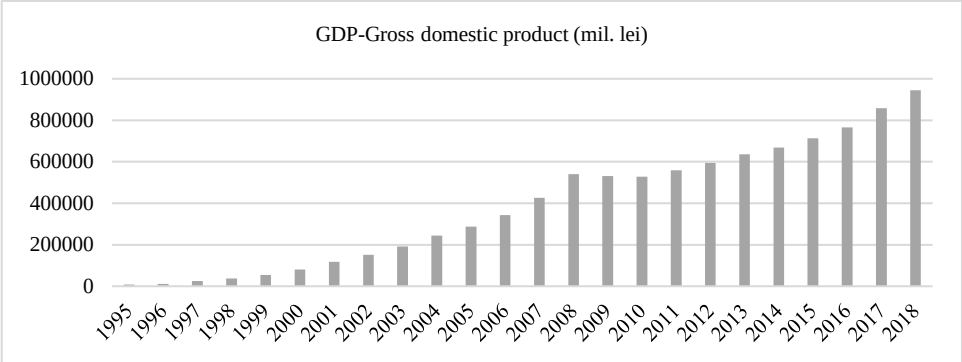

Figure 1 - The evolution of indicator to *GDP* between 1995- 2018
Source: Elaborated by the authour using the data on the http://www.insse.ro/cms/

Analyzing the evolution of the GDP indicator, it is observed a growth during the analyzed period. Between 1995 and 2008, the value of GDP increased 70,932 times, the most impressive growth in Romania's history, despite the fact that economic development and growth do not explain the high value of GDP. The decrease of 2,146% recorded in 2009-2010 corresponds to the period of the global economic crisis that affected Romania. Although it was known since 2008 of the US economic crisis that reached alarming proportions, in Romania it was felt later, and the political class did not recognize this. However, in 2010 the government took some austerity measures by cutting budgetary salaries, lowering social benefits and increasing the VAT from 19% to 24% and thus Romania is entering a process of economic growth. Therefore, the post-crisis policies governing Romania have generated a 78,746% GDP growth, so that in Romania there is a sustainable economic development.

Table 1. Statistics GDP

Gross domestic product (mil. lei)		
N	Valid	24
	Missing	0
Std. Error of Mean		60197.14641
Std. Deviation		294904.58540
Minimum		7610.60
Maximum		944220.20

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

According to Table 1 the average value of GDP for the period considered is 388.122,5958 million lei.

The evolution of the indicator specific to *IMP* during the timescale under analysis were illustrated in Figure 2:

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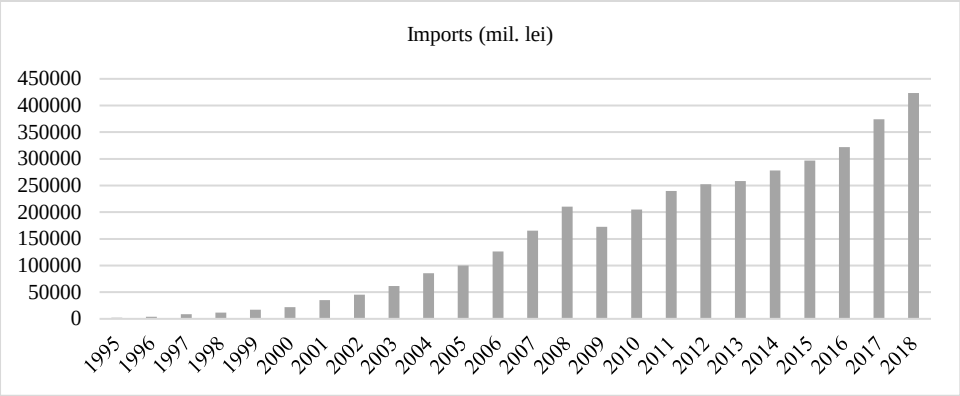

Figure 2 - The evolution of indicator to *IMP* between 1995- 2018
Source: Elaborated by the authour using the data on the http://www.insse.ro/cms/

The evolution of the IMP during the analyzed period has a significant increase of 181,492 times in 2018 compared to 1995. The value of the imports registered a continuous increase (1995-2008, 2009-2018). It is noteworthy the year 2009, the year of the financial crisis, where the value of the import was registered decreased reaching a percentage of 18,215%. Analyzing the evolution of the IMP over the period 2010 - 2018, we observe a doubling of the value. The most significant annual growth is 51775 million lei and was registered in 2017.

Table 2. Statistics IMP

Import of goods and services (mil. lei)		
N	Valid	24
	Missing	0
Std. Error of Mean		26421.65893
Std. Deviation		129439.16510
Minimum		2333.50
Maximum		423511.60

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

According to table 2 the average value of the IMP for the period considered is 154884.325 million lei. Therefore, analyzing the two macroeconomic indicators, it is observed that their evolution is similar, with increases between 1995-2008 and 2009-2018 and a decrease during 2008-2009 when in Romania the global economic crisis was registered.

The estimated equation of the quadratic regression model has the following form:

$$GDP = \alpha + \beta\ IMP + \gamma\ IMP^2\ ,$$

where GDP represents the gross domestic product and is the dependent variable, and the IMP represents the import of goods and services and is the independent variable, according to Table 3:

Table 3. Regression model variables

Variable Processing Summary			
		Variables	
		Dependent	**Independent**
		GDP-Gross domestic product (mil. lei)	**IMP-Import of goods and services (mil. lei)**
Number of Positive Values		24	24
Number of Zeros		0	0
Number of Negative Values		0	0
Number of Missing Values	User-Missing	0	0
	System-Missing	0	0

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

The description of the model is given in Table 4:

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Table 4. Model Description

Model Name		**MOD_1**
Dependent Variable	1	GDP-Gross domestic product (mil. lei)
Equation	1	Quadratic
Independent Variable		IMP-Import of goods and services (mil. lei)
Constant		Included
Variable Whose Values Label Observations in Plots		Unspecified
Tolerance for Entering Terms in Equations		.0001

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

The correlation between the flows of imports and the gross domestic product has been analyzed in many specialized studies. The intensity of the links between the two variables, the GDP dependent variable and the independent variable IMP is given by the correlation matrix:

Table 5. Correlation matrix

		GDP-Gross domestic product (mil. lei)	**IMP-Import of goods and services (mil. lei)**	**IMP-Import of goods and services (mil. lei) ** 2**
Pearson Correlation	GDP-Gross domestic product (mil. lei)	1.000	.994	.924
	IMP-Import of goods and services (mil. lei)	.994	1.000	.953
	IMP-Import of goods and services (mil. lei) ** 2	.924	.953	1.000
Sig. (1-tailed)	GDP-Gross domestic product (mil. lei)	.	.000	.000
	IMP-Import of goods and services (mil. lei)	.000	.	.000
	IMP-Import of goods and services (mil. lei) ** 2	.000	.000	.
N	GDP-Gross domestic product (mil. lei)	24	24	24
	IMP-Import of goods and services (mil. lei)	24	24	24
	IMP-Import of goods and services (mil. lei) ** 2	24	24	24

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

In the correlation matrix (Table 5) the Pearson correlation coefficients between the GDP dependent variable and the independent variables IMP are calculated and the value of the coefficients is significant for a linear link, since the significance level (Sig.) Is lower than the 0.05 significance threshold. The intensity of the link between GDP and GDP is given by the Pearson correlation coefficient of 0.994 and expresses the very strong, positive and linear relationship between the two variables.

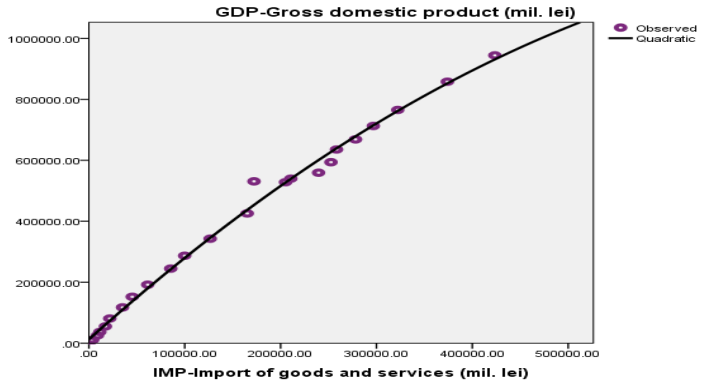

Figure 3 - Link between GDP and IMP

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

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The dependence between the dependent variable GDP-Gross domestic product (million lei) and the independent variable IMP-Import of goods and services (million lei) is explained by the quadratic model according to the graphical representation in Figure 3.

The estimated parameters of the quadratic regression model are presented in Table 6:

Table 6. Estimation of regression model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
IMP-Import of goods and services (mil. lei)	2.828	.118	1.241	23.892	.000
IMP-Import of goods and services (mil. lei) ** 2	-1.557E-6	.000	-.259	-4.987	.000
(Constant)	12462.499	8719.495		1.429	.168

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

According to table 6, the coefficients of the regression model have the values $\alpha = 12462.499$, $\beta = 2.828$ and $\gamma = -1.557 \cdot 10^{-6}$. The estimated equation of the quadratic regression model is of the form:

$$GDP = 12462.499 + 2.828\ IMP - 1.557 \cdot 10^{-6}\ IMP^2$$

Because $\beta > 0$, we can conclude that the growth of the IMP will lead to a decrease of the GDP, therefore the IMP has a great weight on the GDP and is an important component in the sustainable economic growth. According to the model we have a parabola (Figure 4) with a point of maximum coordinates, so we observe that the value of IMP for 2018 is higher than the value of IMP according to the model analyzed. Under these conditions, policies to promote imports as a strategy for the development of sustainable economies should be concluded and the national economy, as well as exports, should be promoted and supported.

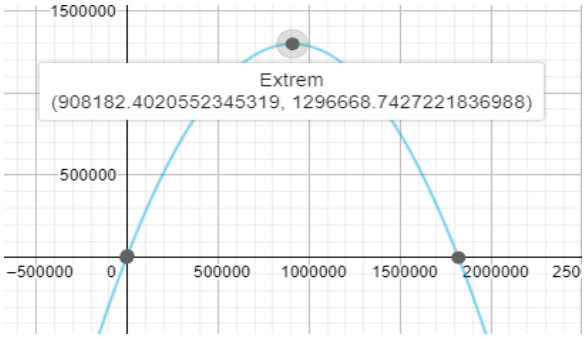

Figure 4 - Graph of quadratic regression

Source: Authors Computation with the aid of Geogebra

The values of the t test (Student) are calculated in the Coefficients table (table 6) and verify for the analyzed equation the hypotheses of the variable in the model (3). The value of Test t for IMP is 23,892, and Sig = 0.000, which is less than the significance threshold of 0.05. This can be interpreted with a 95% probability that there is a significant link between GDP and IMP.

The Model Summary table (Table 7) presents the correlation and determination indicators that measure the intensity between the quadratic model variables.

Table 7. Model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.997	.995	.994	22224.358
The independent variable is IMP-Import of goods and services (mil. lei).			

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

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According to Table 7, where the correlation ratio is and the determination ratio is $R^2 = 0.995$, the high value of these indicators shows that there is a strong correlation between the GDP dependent variable and the independent variable IMP. It follows that 99.7% of the GDP variation is explained by the variation of the IMP in the quadratic model.

The ANOVA table (Table 8) presents the estimated explained variation $1.990 \cdot 10^{12}$, estimated residual variation $1.037 \cdot 10^{12}$, estimated total variation de $2.000 \cdot 10^{12}$, estimated degrees of freedom df1 = 2 and df2 = 21 and the value of Fisher statistics, in value of 2014.395 which is much higher than the table value and the sig. lower than the significance threshold shows us that the quadratic model is valid, which can be seen from the graph corresponding to figure 3. It is 95% likely to reject the hypothesis that the model is not valid, there is a significant connection between the two variables, IMP and GDP.

Table 8. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1989908069000.000	2	994954034700.000	2014.395	.000
Residual	10372363420.000	21	493922067.500		
Total	2000280433000.000	23			
The independent variable is IMP-Import of goods and services (mil. lei).					

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

The minimum and maximum values of the residue are presented in Table 9. The highest value of the residue, 77453.69531, is recorded in 2009 when the highest GDP growth takes place, so Romania's economic growth policies were efficient and correctly implemented.

Table 9. Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	19053.3398	930857.0000	388122.5958	294138.98440	24
Residual	-41378.44922	77453.69531	.00000	21236.10893	24
Std. Predicted Value	-1.255	1.845	.000	1.000	24
Std. Residual	-1.862	3.485	.000	.956	24
a. Dependent Variable: GDP-Gross domestic product (mil. lei)					

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

The histogram is equivalent to the frequency table graph and must follow a normal distribution.

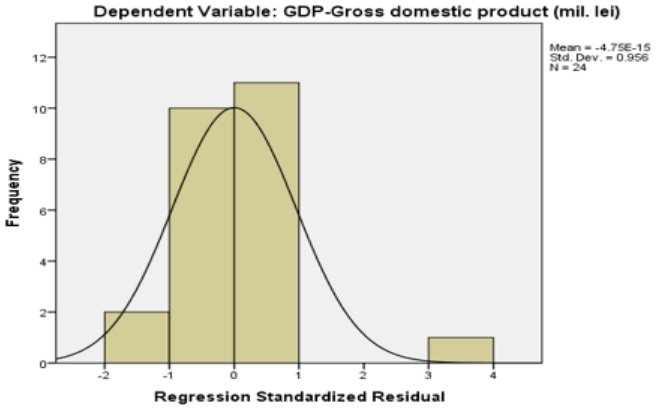

Figure 5 -Histogram

Source: Authors Computation with the aid of IBM SPSS Statistics, version 24

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III. CONCLUSION

The purpose of this paper is to analyze the influence of the import of goods and services on the gross domestic product for the period 1995-2018. The period analyzed is a critical period for the Romanian economy, the global economic crisis, which broke out over the ocean, was felt by the bankruptcy of the US investment bank Lehman Brothers in September 2008, at the beginning of 2009 when the values of GDP and IMP are declining.

In this paper, the evolution of the gross domestic product was investigated according to the import of goods and services over a period of 24 years, using a nonlinear regression model, namely the quadratic model. From the obtained model we have a point of maximum coordinates, until that point the GDP will increase, and after that point it will decrease. We can conclude that the increase of the IMP will lead to a decrease of the GDP, but the value of the IMP for the year 2018 is higher than the value of the IMP according to the model analyzed, so in these conditions, the policies to promote imports as a strategy for the development of a sustainable economy should be concluded and the national economy, as well as exports, should be promoted and supported. Imports of goods and services have a high share of GDP and are an important component in sustainable economic growth, but they must be kept to a certain level in order to help the Romanian economy. It can be concluded from the analysis of the period 1995 - 2018 that the IMP has a particularly impact on GDP.

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